

A DESCRIPTIVE CATALOGUE OF THE HARVEST-SPIDERS (PHALANGIIDÆ) OF OHIO.

BY

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(With Plates LVII-LXIX.)

The present paper is based upon a study of a large collection of harvest-spiders from all parts of Ohio, gotten together during the writer's connection with the Ohio Agricultural Experiment Station from 1888 to 1891. Most of the specimens were taken, by myself or my assistants, in Franklin County, in the central part of the State, but good series were also obtained from Butler, Cuyahoga, Fairfield, Fulton, and Warren counties, so that all the regions of the State are fairly well represented.

The Phalangiid fauna as a whole is quite similar to that of Illinois, which I catalogued in 1887.\* It is very much richer in species than either New Hampshire on the north (six species) or Mississippi on the south (three species), both of which I have recently treated of.† The family seems to reach its maximum development in the latitude of central and southern Ohio.

The figures accompanying were drawn by Miss Freda Detmers, under my direction. Most of them have been used in previous papers, but some appear here for the first time. The localities are given by counties.

Family PHALANGIIDÆ.

Subfamily PHALANGIINÆ.

Members of this subfamily are Arachnids having the body composed of a single piece, and long, slender legs. The teguments are not coriaceous, though often quite solid. The segments are only indicated by striae, which are often obsolete. There are five ventral abdominal segments; a single anal piece, and two distinct lateral pores on the upper margin of the cephalothorax. The maxillary lobe of the palpus has two tubercles, and the epistoma is in the form of an elongated triangular plate.

\* Bull. Ill. St. Lab. Nat. Hist., III, 97.

† Trans. Am. Ent. Soc., XIX, 261; Psyche, VI, 425.

The three genera found in Ohio may be distinguished as follows:

- I.—First joint of mandibles with a tooth on ventral surface near base,  
 A.—Maxillary lobes of second pair of legs with a large base, impressed, straight and elongated, not attenuate, but rather a little enlarged from the base to the apex and very obtuse; claw of palpus denticulate ..... *Liobunum*.  
 B.—Maxillary lobes of second pair of legs forming elongated triangles, quite large at the base, then gradually retracted, not impressed, with anterior border straight; claw of palpus not denticulate ..... *Mitopus*.  
 II.—First joint of mandibles without tooth ..... *Phalangium*.

*Liobunum* C. Koch, 1839.

Anterior and lateral borders of the cephalothorax smooth. Eye eminence rather small; smooth, or provided with small, slightly distinct tubercles; widely separated from the cephalic border. Lateral pores small, oval, and marginal. Anal piece large, transverse oval or semi-circular, much wider than long, and much wider than the reflected borders of the eighth segment. Mandibles short, similar in the two sexes; first joint furnished at the base below with an acute tooth. Palpi simple; femur, patella, and tibia without any process and without projecting angles; maxillary lobe provided at the base with two strong conical teeth. Maxillary lobe of the second pair of legs very long, nearly straight from the base, not attenuated, directed mesad nearly horizontally, and united on the ventro-meson to the lobe from the opposite side without forming a sensible angle; the two together lightly arched on the cephalic border, and forming an even curve. Sternal piece large, slightly contracted between the fourth pair of coxae, gradually enlarging and obtusely truncate cephalad. Legs very long and slender; tibia of the second pair with a few false articulations. Palpal claw denticulate.

The species of *Liobunum* found in Ohio, with the exception of *L. bicolor*, may be distinguished by the following artificial key, which applies especially to the males. I have not seen mature specimens of this sex of *L. bicolor*, and so have not included it:

1. Femur of front leg shorter than body ..... 3
2. Femur of front leg longer than body ..... 5
3. Dorsum grayish-brown, spotted ..... *maculosum*
4. Dorsum reddish-brown, not spotted ..... *grande*
5. Femur of palpus with a distinct spur on its outer ventro-lateral angle ..... *calcar*
6. Femur of palpus without a spur ..... 7
7. A distinct black longitudinal central marking on dorsum ..... 9
8. No distinct black central marking ..... 11
9. Second legs 70–100<sup>mm</sup> in length; southern .....  *vittatum*
10. Second legs 45–70<sup>mm</sup> in length; northern .....  *vittatum dorsatum*
11. Body and legs cinnamon or yellowish-brown ..... *ventricosum*
12. Body brown, legs black ..... 13
13. Palpi black ..... *nigropalpi*
14. Palpi brown ..... 15
15. Second legs with a white ring at distal end of tibia ..... *longipes*
16. Second legs black throughout ..... 17
17. Eye-eminence with two rows of many tubercles; body small ..... *politum*
18. Eye-eminence with few tubercles; body of medium size ..... *nigripes*

*Liobunum vittatum* (Say) Weed.

(Plate LVII, Figs. 1, 2; Plate LVIII.)

*Phalangium vittatum* Say, Jour. Phila. Acad., II, 65; Wood, Conn. Essex Inst., VI, 20; Underwood, Can. Ent., XVII, 168.

*Liobunum vittatum* Weed, Am. Nat., XXI, 935; XXVI, 999; Bull. Ill. St. Lab. Nat. Hist., III, 85, 101; Psyche, VI, 426.

MALE.—Body 7<sup>mm</sup> long; 4<sup>mm</sup> wide. Palpi 7<sup>mm</sup> long. Legs: first, 44<sup>mm</sup>; second, 89<sup>mm</sup>; third, 45<sup>mm</sup>; fourth, 64<sup>mm</sup>.

Dorsum reddish-brown, with a dark central marking, commencing at eye eminence and extending backward to the ultimate or penultimate abdominal segment. Contracting slightly near the anterior margin of abdomen, then gradually expanding until about the beginning of the posterior third of the abdomen, where it again slightly contracts. Ventrums slightly paler than dorsum, both finely granulate. Eye eminence a little wider than high, black above, canaliculate, with small black tubercles over the eyes. Mandibles light yellowish-brown, tips of claws black; second joint with short sparse hairs. Palpi long, reddish-brown; tarsal joints paler. Femur and patella arched; with two rows of rather-blunt, dark tubercles on the outer ventro-lateral surface; femur also having a few small subobsolete ones on its dorsal surface. Tibia with a similar row on its outer ventro-lateral surface, a short row on the distal portion of its inner ventro-lateral surface, and a short row on the proximal portion of its ventral surface. Tarsus pubescent, with a row of short, blunt, black tubercles on its inner ventro-lateral surface, extending from the base to near the apex. Legs black; coxæ reddish-brown, minutely tuberculate; trochanters with minute scattered tubercles; femora and patellæ with rows of small spines; tibiæ with very short hairs. Shaft of genital organ slender, subcylindrical, not broadened distally, but bent at an obtuse angle and terminating in a very acute point.

FEMALE.—Body 8–9<sup>mm</sup> long; 5–6<sup>mm</sup> wide. Palpi 5<sup>mm</sup> long. Legs: first, 42<sup>mm</sup>; second, 90<sup>mm</sup>; third, 43<sup>mm</sup>; fourth, 61<sup>mm</sup>.

Besides its rounder body and much more robust appearance, it differs from the male as follows: Dorsum of a much darker shade of brown with less of the reddish tint, and the ventrum paler. Second joint of mandibles with fewer hairs. Palpi shorter, more slender, with the rows of tubercles on the tibia subobsolete, and that on the tarsus entirely wanting. Legs generally light-brown with black annulations at the articulations. Ovipositor whitish, with no dark color in apical rings.

Ohio: Lawrence, August, 1888; July, September, 1889; Warren, summer of 1889.

This abundant species is commonly found in the extreme southern counties of the State. It runs into the form described by Say as *Phalangium dorsatum*, now known as *Liobunum vittatum dorsatum*, and

\* Amer. Naturalist, XXVI, 1004, in an article discussing at some length the geographical variations of this species.

it is difficult to draw the line between them. I have suggested\* that it would be well to refer to *dorsatum* the forms from those localities in which the average length of the second pair of legs of the males is less than 70 or possibly 75<sup>mm</sup>. According to this division most of the forms from the central and northern portions of the State would belong to *dorsatum*.

***Liobunum vittatum dorsatum* (Say) Weed.**

(Plate LVII, Fig. 3.)

*Phalangium dorsatum* Say, Jour. Phil. Acad., II, p. 66. Compl. writ., II, p. 13.

Wood, Conn. Essex Inst., VI, p. 18.

*Liobunum dorsatum* (Say). Weed, Amer. Nat., XXI, p. 435. Bull. Ill. State Lab. Nat. Hist., III, p. 83.

*Liobunum vittatum dorsatum* (Say). Weed, Amer. Nat., XXVI, p. 786.

This form differs from *L. vittatum* only in its smaller body and shorter legs. The average length of legs of seventeen specimens, taken at Columbus, was as follows: First, 35<sup>mm</sup>; second, 69.8<sup>mm</sup>; third, 35<sup>mm</sup>; fourth, 50.2<sup>mm</sup>. A very short-legged specimen of this form, from Dakota, is shown in Fig. 3, Plate LVI.

This is perhaps the most abundant representative of the family in the central and northern part of the State. "This species evidently passes the winter in the egg state, as it has never been taken during the winter or early spring months. The eggs of the northern form apparently do not hatch very early, probably not until May, and the young grow slowly. Occasionally I have found a fully developed one during the latter part of June, but generally they do not become mature until July. My collections show two half-grown specimens taken at Columbus, Ohio, July 30, 1888, and another collected in the same locality July 16, 1888, which is not fully developed.

"When very young these harvest-men seem to prefer the shelter of the grasses, low herbage, and rubbish piles, but as they grow larger they are to be found in a great variety of situations. In the prairie regions of central Illinois, where nearly all of the country is occupied by corn fields and osage orange hedges, the young are very common on the corn plants, where, as I have elsewhere surmised, they probably live upon the numerous small insects drowned in the moisture contained in the bases of the unfolding leaves, as well as on the corn plant lice (*Aphis maidis*). The full-grown individuals are to be found nearly everywhere, on bushes and trees in the woods, in meadows and pastures, along fences, and in sheds and outhouses. They occur abundantly from July to October.

"The only opportunity I have had of studying the long-legged southern form in the field was in southern Illinois during the autumn of 1886. Along the rocky ledges running across the State and through Union County, these harvest-spiders were exceedingly abundant, occurring everywhere on the rocks and ground. They were so numerous that as one walked in the open groves on the farm of Mr. Parker Earle they would run along in droves.

"This species, like others of its family, has the power of exuding from about the coxæ a liquid with a peculiarly disagreeable odor. This doubtless serves as a protection from birds and other enemies."\*

*Liobunum nigropalpi* (Wood) Weed.

(Plate LIX.)

*Phalangium nigropalpi* Wood, *Conn. Essex Institute*, vi, 22-23, 39.

*Phalangium nigropalpi* Wood, *Underwood*, *Can. Ent.*, xvii, 168.

*Liobunum nigropalpi* (Wood). Weed, *Amer. Nat.*, xxiv, 918; *Trans. Am. Ent. Soc.*, xix, 187.

MALE.—Body 6-7<sup>mm</sup> long, 4<sup>mm</sup> wide; palpi 5<sup>mm</sup> long. Legs: first, 40-51<sup>mm</sup>; second, 75-92<sup>mm</sup>; third, 39-48<sup>mm</sup>; fourth, 60-70<sup>mm</sup>.

Body elongate, narrowed posteriorly. Dorsum reddish brown, of a nearly uniform tint, with a faint central marking, and scattered yellowish spots; minutely tuberculate. Eye eminence black, slightly canaliculate, with a row of rather small, black, distant tubercles on each carina. Mandibles light yellowish brown, tips of claws black; second joint with sparse hairs. Palpi well developed; black, except tarsus, which is brownish; a row of tubercles on outer ventro-lateral surface of femur; femur, patella, and tibia each somewhat arched; a few tubercles on lateral surface of proximal portion of patella, and a row of flattened black tubercles on the inner ventro-lateral surface of tarsus; ventral surface of tibia clothed with stiff black hairs. Ventral surface, including coxæ, of nearly the same color as the dorsum, but a little lighter; coxæ tipped with white. Legs very long and slender; trochanters dark brown, more or less blackish; rest of legs blackish. Genital organ flattened, bent with a double bow-like curve, contracted at its distal extremity, and ending in a short acute point.

FEMALE.—Body 7.5<sup>mm</sup> long, 4.5<sup>mm</sup> wide; palpi 5<sup>mm</sup> long. Legs: first, 37<sup>mm</sup>; second, 70<sup>mm</sup>; third, 38<sup>mm</sup>; fourth, 51<sup>mm</sup>.

Differs from male as follows: Body larger, rounder; central marking more distinct; inner distal lateral angle of patella more conical; row of tubercles on tarsus of patella obsolete; legs brown rather than black.

Fairfield County, September 20, 1890. This is a rare species for Ohio. The only time I have taken it in the State was at Sugar Grove on top of a wooded hill, where I saw several specimens running about on the fallen leaves.

*Liobunum nigripes* Weed.

(Plate LX.)

*Liobunum verrucosum* (Wood). Weed, *Amer. Nat.*, xxi, 935; *Bull. Ill. State Lab. Nat. Hist.*, iii, 88-89, 102; *Amer. Nat.*, xxiv, 918.

*Liobunum nigripes* Weed, *Trans. Am. Ent. Soc.*, xix, 190.

MALE.—Body 6.5<sup>mm</sup> long; 4<sup>mm</sup> wide; palpi 4.5<sup>mm</sup> long. Legs: first, 27<sup>mm</sup>; second, 50<sup>mm</sup>; third, 28<sup>mm</sup>; fourth, 30<sup>mm</sup>.

\* Weed, *Amer. Naturalist*, xxvi, 1004.

Dorsum minutely tuberculate, almost appearing finely granulate, ferruginous brown, somewhat darker in front, with a faint indication of a dark central marking in some specimens, and indistinct transverse rows of yellowish dots. Eye eminence developed, slightly longer than high, black above, very slightly canaliculate, with two rows of small, black tubercles, frequently subobsolete. Mandibles light brown, tips of claws black; second article with sparse, dark hairs. Palpi slender, grayish or brownish in some specimens, with more or less black on basal joints; femur with short, scattered hairs; ventral surface beset with well-developed black tubercles; patella curved, with short hairs and small black tubercles; tibia and tarsus thickly beset with short hairs, without tubercles, except a subobsolete row on the inner ventro-lateral surface of tarsus. Ventrums grayish brown, cephalic portion tuberculate. Legs, including trochanters, black; trochanters tuberculate; femora, patellæ, and tibiæ with rows of small spines. Shaft of genital organ straight, except at tip, broad, flat; about two-thirds of the way from the base to the apex expanding into an alate portion, which continues for about one-fifth the entire length of the shaft, then suddenly contracting into a rather robust, curved, canaliculate end, and terminating in an acute point; with two curved spinous hairs just behind the base of the jointed tip.

FEMALE.—Body 9<sup>mm</sup> long; 4<sup>mm</sup> wide; palpi 4.5<sup>mm</sup> long. Legs: first, 28<sup>mm</sup>; second, 48<sup>mm</sup>; third, 26<sup>mm</sup>; fourth, 40<sup>mm</sup>.

Besides its larger size the female differs from the male in the much darker color of the dorsum, which varies from dark ferruginous brown to almost black; in color of ventrum, which is grayish rather than brown; and in having the legs, except trochanters, brown rather than black.

Specimens of this species have been collected in Clermont County, August, 1890; Franklin, July 7–10, 1890; Warren, June 28, July 23, 1890.

The sexes of this species are quite unlike. In first going over my collections I separated the males in one series and the females in another, thinking them different species, but on finding that the specimens of one of the supposed kinds were all males and the others all females, and that in nearly every instance the two forms had been taken at the same time and place, I had little hesitancy in considering them the same.

During July, 1890, this form was very common in central Ohio. But it does not appear to be so in other places, as I have no specimens from any other state except Illinois.

#### *Liobunum politum* Weed.

(Plate LXI.)

*Liobunum politum*, Weed, Bull. Ill. St. Labr. Nat. Hist., III, p. 89; Amer. Nat., xxv, p. 295; Trans. Am. Ent. Soc., XIX, p. 266.

MALE.—Body 5<sup>mm</sup> long; 2.8<sup>mm</sup> wide; palpi 3.5<sup>mm</sup> long. Legs: first, 25<sup>mm</sup>; second, 51<sup>mm</sup>; third, 26<sup>mm</sup>; fourth, 36<sup>mm</sup>.

Dorsum smooth, finely granulate; clear reddish brown, with no markings, except occasionally a faint indication (shown by a slightly darker shade) of the usual central dark marking. Eye eminence rather prominent, slightly constricted at base, black above, canaliculate, with a regular curved series of small, acute, black spines over each eye. Mandibles whitish, tips of claws black. Palpi slender, light brown, with femur and patella dusky; finely pubescent, with a subobsolete row of minute dark tubercles on the inner ventro-lateral surface of femur, and another row on the inner ventro-lateral surface of tarsus; joints slightly arched. Ventrum with coxæ, including the membranous distal lateral tips, and generally the trochanters, vermilion red. Legs with proximal portions light-brown; distally dark brown or blackish. Shaft of genital organ nearly straight, slender, flattened, canaliculate; distal portion very slightly expanded, then slightly contracted, and again expanded into a half spoon-shaped portion, and terminating in a small acute point.

FEMALE.—Differs from the male in having a larger, rounder body, and in the color of the dorsum, which is brown, with a rather distinct, darker central marking, and numerous whitish spots arranged more or less transversely. In some specimens the central marking is subobsolete. Apical rings of ovipositor white.

Specimens of this handsome and abundant species have been taken in the following counties of Ohio, on the dates given: Champaign, August 18, 1890; Clermont, August, 1890; Delaware, September 18, 1890; Franklin, July 9, 1889; July 7, 8, 9, 10, 27, 31; August 6, September 2, 5, 6, 9, 1890; Lawrence, September 5, 6, 1890; Madison, July 19, 1890; Scioto, September 3, 1890; Warren, July 5, August 14, 16, 1890.

“This harvest spider is an out-door species, occurring abundantly in fields and woods, although seldom found about barns and outhouses. During the past summer (1890) I have taken great numbers in Franklin County, Ohio, in the grass along the banks of a small creek, and among the driftwood left by the overflowing of the Olentangy River. The species becomes fully developed early in July, and the males and females are about equally abundant. Both sexes when disturbed emit from the coxal region a liquid having a peculiarly sharp, pungent odor.

“I placed a number of these harvest spiders in a large glass vivarium July 10, 1890. Two days afterward a pair were observed mating. They were standing on one of the vertical sides of the vivarium, facing each other. The male kept waving his second pair of legs in the air; his body was somewhat more elevated than that of his mate, being inclined downward and forward, while that of the latter was inclined upward in front. Similar observations were subsequently made on many other individuals. When alarmed both sexes have a habit of standing on six legs, rapidly vibrating the body and moving the second legs in

a partial transverse circle in the air. In confinement they eagerly devour plant lice.\*

In New England I have taken this species oftenest while sweeping the insect net over grass lands.

*Liobunum longipes* Weed.

(Plate LXII, Fig. 1.)

*Liobunum nigropalpi* (Wood). Weed, Am. Nat. XXI, 935, Bull. Ill. St. Lab. Nat. Hist., III, 1890.  
*Liobunum longipes* Weed, Am. Nat., XXIV, 918; Trans. Am. Ent. Soc., XIX, 265.

MALE.—Body 4<sup>mm</sup> long, 3<sup>mm</sup> wide. Palpi 4<sup>mm</sup> long. Legs: first, 41–49<sup>mm</sup>; second, 82–99<sup>mm</sup>; third, 43–50<sup>mm</sup>; fourth, 59–67<sup>mm</sup>.

Dorsum minutely tuberculate, reddish brown, with a slightly darker, subobsolete, central marking, sometimes simply represented by obscure, brown blotches. Eye eminence at least as broad as high, black above, canaliculate, with rows of small, black tubercles on the carinae. Mandibles light yellowish brown, tips of claws black; second joint with sparse hairs. Palpi slender, light brown, distal portion of femur and almost all of patella, usually a little darker, sometimes almost black; femur, patella, and tibia with small scattered tubercles and short hairs; tarsus pubescent, with a row of small, black tubercles on its inner ventrolateral surface. Ventrums, including coxae, paler than dorsum, of a nearly uniform, light brown tint; coxae tuberculate, tips white; trochanters black. Legs very long, slender, black or brownish black; generally though not always with apical tenth of tibiae of second pair white; shaft of genital organ flattened, contracted near its distal extremity and bent upward, terminating in an acute point.

FEMALE.—Body 6<sup>mm</sup> long; 4<sup>mm</sup> wide. Palpi 4<sup>mm</sup> long. Legs: first, 39<sup>mm</sup>; second, 72<sup>mm</sup>; third, 40<sup>mm</sup>; fourth, 51<sup>mm</sup>.

Besides its larger body and shorter legs it differs from the male in having the dorsum slightly smoother, with more or less dark markings, and the central marking more distinct.

Ohio: Clermont, August, 1890; Fairfield, September, October, 1890; Franklin, August 6, 1890.

The females of this form are rare. I have a single specimen taken in Fairfield County during October which may be a fully developed female of this species: its body is large and swollen by eggs. Its legs are dark brown with white annulations at all the joints, including those of tarsi, and a transverse white blotch on dorsum of abdomen. If this is the female *longipes* the forms with plain brown legs must be immature conditions of it.

*Liobunum ventricosum* (Wood) Weed.

(Plate LXIII.)

*Phalangium ventricosum* Wood, Conn. Essex Inst., VI, 32, 33, 39, fig. 7.

*Phalangium ventricosum* Wood. Packard's Guide to the Study of Insects, p. 657, fig. 633.

*Phalangium ventricosum* Wood. Underwood, Can. Ent. XVII, 169.

\* Weed, Amer. Nat., XXV, 296.



*Liobunum* (?) *ventricosum* (Wood). Weed, Amer. Nat., XXI, 935.

*Liobunum* (?) *ventricosum* (Wood). Weed, Bull. Ill. State Lab. Nat. Hist., III, 101.

*Liobunum ventricosum* (Wood). Weed, Amer. Nat., XXIV, 918; Trans. Am. Ent. Soc., XIX, 188.

MALE.—Body 7<sup>mm</sup> long; 5<sup>mm</sup> wide; palpi 6<sup>mm</sup> long. Legs: first 35<sup>mm</sup>; second, 68<sup>mm</sup>; third, 35<sup>mm</sup>; fourth, 53<sup>mm</sup>.

Body elongate; abdomen conical or pear-shaped. Dorsum, legs including trochanters, and palpi varying from dark cinnamon-brown to ferruginous brown, most commonly cinnamon rufous. Ventrum light grayish brown. Dorsum closely granulate with an indistinct darker marking, and numerous small grayish spots arranged in irregular transverse series. Eye eminence black, except at base; rounded, not caniculate, smooth, or with a few small, acute tubercles. Palpi rather slender, with none of the angles prolonged; femur with a very few small spinous tubercles and hairs; patella strongly, and femur and tibia slightly arched; coxæ minutely tuberculate, tipped with white; trochanters and legs cinnamon rufous; tarsi dusky. Legs long and moderately robust. Genital organ of male "flat, nearly straight, slender at the basal portion, gradually widening and distally rather quickly expanded into a broad alate portion, and then abruptly contracted into a moderately robust, slightly curved point, which is placed at an angle to the rest of the shaft; at the base of the point a marked notch in the end of the shaft.

FEMALE.—Body 10.5<sup>mm</sup> long; 5.5<sup>mm</sup> wide; palpi 5<sup>mm</sup> long. Legs: first, 32<sup>mm</sup>; second 62<sup>mm</sup>; third, 32<sup>mm</sup>; fourth, 45<sup>mm</sup>.

Differs from the male in the very much larger size of its body. The abdomen in most specimens is greatly swollen, especially below.

Ohio: Franklin County, June 13, 1889; July 8, 1890; September 25-30, 1888; Warren County, August 7, 1890.

The immature form of this species was described by Wood as *Phalangium formosum*, and was later referred by myself to the genus *Forbesium*. The young occur rather commonly during autumn, winter, and spring, under boards and logs, being very much more abundant than I have ever found the adults. They become mature early in June.

This immature form as found in spring shortly before maturity is represented in fig. 1, and is described as follows:

Dorsum remarkably smooth, mottled with gray and blackish brown; a wide, dark brown or black central marking commences on the cephalic margin and runs to the middle of the fifth abdominal segment, where it abruptly terminates; it is expanded

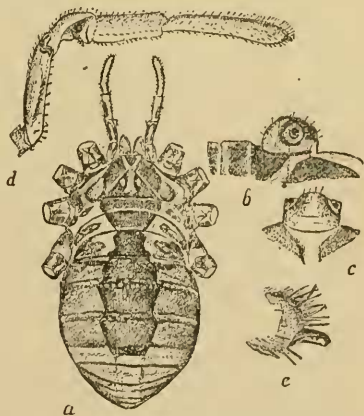


Fig. 1.—*Liobunum ventricosum*. Immature: a, body; b, eye eminence, side view; c, same, front view; d, palpus; e, palpal claw; all magnified.

on the cephalothorax, contracted on the first abdominal segment, and then again expanded. The entire abdomen caudad of the middle of the fifth segment usually much lighter than the part cephalad. There is a peculiar oblique sinus caudad of each lateral pore. Eye eminence brownish, perfectly smooth, not at all canaliculate, almost hemispherical. Mandibles whitish, with the usual black tips to the claws; second article with sparse blackish hairs on dorsal surface. Palpi rather slender, mottled, distally whitish; furnished with short blackish hairs. Patella with its inner distal lateral angle prolonged into a short apophysis, and having a rather thin brush of hairs on its inner lateral surface. Tarsal claw denticulate. Ventrums, including coxæ, grayish brown, cephalic portion with short dark hairs. Trochanters brownish black. Legs light brown, ringed with dark brown; furnished with very minute blackish spines.

*Liobunum bicolor* (Wood) Weed.

(Plates LXIV and LXV.)

*Phalangium bicolor* Wood, Conn. Essex Institute, vi, 28, 39.

*Phalangium bicolor* Underwood, Can. Ent., xvii, 168.

*Liobunna* (?) *bicolor* Weed, Amer. Nat., xxi, 935.

*Liobunum* (?) *bicolor* Weed, Bull. Ill. St. Lab. Nat. Hist., iii, 133.

*Liobunum elegans* Weed, Bull. Ill. St. Lab. Nat. Hist., iii, 89, 102.

*Astrobinus* (?) *bicolor* Weed, Amer. Nat., xxxiv, 918.

*Liobunum elegans* Weed, Amer. Nat., xxxiv, p. 918.

FEMALE:—Body 4<sup>mm</sup> long, 2.5<sup>mm</sup> broad. Legs: first, 24<sup>mm</sup>; second, 48<sup>mm</sup>; third, 24<sup>mm</sup>; fourth, 37<sup>mm</sup>.

Dorsum blackish, with a faint indication of a lighter central marking; a large triangular reticulated patch on the cephalothorax, the posterior portion including the eye eminence; behind this is a smooth grayish black space which is interrupted by a transverse reticulated band parallel with the front of the posterior coxæ; a large quadrangular reticulated brown patch on the central portion of the abdominal dorsum, behind which are two other transverse reticulated bands. There are also on the dorsum of the abdomen more or less distinct transverse rows of whitish tubercles with black tips. Segmentation between cephalothorax and abdomen and between segments of latter obsolete. Eye eminence prominent, dark brown, canaliculate, with a row of well-developed acute brown tubercles on each carina. Mandibles light yellowish brown, with very little black on claws; tooth on lower surface of first joint distinct; both joints smooth, with only a few indistinct whitish hairs. Palpi light brown, with femur and tibia more or less dusky; all joints except tarsi with numerous small spinose tubercles. Ventral surface, including coxæ, whitish brown; a transverse row of minute tubercles on each abdominal segment. Coxæ closely tuberculate. Trochanters grayish. Legs light brown, very slender, long; proximal joints with rows of acute conical tubercles.

In Dr. Wood's description the patches mentioned above are spoken of as consisting of "close, small black tubercles," but under a high power they are seen to have a reticulate surface.

Ohio: Franklin, October 2, 1889; October 13, 1890; Henry, August 18, 1890 (immature).

An examination of more than fifty specimens of a harvest spider in various stages of development, taken along the banks of the Maumee River, in Henry County, August 18, 1890, leads to the conclusion that the form from Illinois described some years ago as *Liobunum elegans* is an immature stage of the male of the present species. I have never found any adult males. The forms described as *elegans* are illustrated in Plate LXV and their description is as follows:

MALE.—Body, 3.2<sup>mm</sup> long, 2.1<sup>mm</sup> wide. Palpi, 2.1<sup>mm</sup> long. Legs: first, 19<sup>mm</sup>; second, 38<sup>mm</sup>; third, 20<sup>mm</sup>; fourth, 29<sup>mm</sup>.

Dorsum blackish at the margins, especially on the abdomen, and light brownish in the middle, with a faint indication of a central marking. Finely granulate, with numerous very small black tubercles scattered in patches over the surface and a transverse row of large whitish tubercles on each abdominal segment. Eye eminence prominent, light brown, darker above; canaliculate, with two rows of well developed tubercles having whitish bases and black tips. Mandibles whitish, tips of claws black. Palpi slender, light brown. Femur, patella, and tibia, with distant short spinose tubercles. Tarsus with whitish hairs. Ventrums whitish brown, with a transverse row of tubercles on each abdominal segment, and the pectus and coxae closely tuberculate. Legs very slender, proximal portions light brown, distally darker. Femora furnished with minute blackish spines.

*Liobunum calcar* (Wood) Weed.

*Phalangium calcar* Wood, Conn. Essex Institute, vi, 26-27, 39.

*Phalangium calcar* Wood. Underwood, Can. Ent., xvii, 168.

*Liobunum* (?) *calcar* (Wood). Weed, Amer. Nat., xxi, 935.

*Liobunum* (?) *calcar* (Wood). Weed, Bull. Ill. St. Lab. Nat. Hist., v, iii, 90-91, 102-103.

*Liobunum* (?) *calcar* (Wood). Weed, Amer. Nat., xxiv, 918.

MALE.—Body 7.5<sup>mm</sup> long; 4.5<sup>mm</sup> wide; palpi —<sup>mm</sup> long. Legs: first, 31<sup>mm</sup>; second, 56<sup>mm</sup>; third, 33<sup>mm</sup>; fourth, 40<sup>mm</sup>.

Dorsum reddish-brown; minutely tuberculate; some specimens having a faint indication of a central marking and scattered light-colored spots. Eye eminence well developed; of nearly equal height, length, and breadth; blackish above; slightly canaliculate, with a row of small, acute tubercles on each carina. Mandibles yellowish-brown, with obscure markings of a darker color, especially on the inner dorso-lateral surface of the second joint, where they are sometimes arranged in the form of a series of irregular parallelograms; dorsal surface of second joint sparsely clothed with stiff hairs; tips of claws black. Palpi long, very robust, dark reddish-brown, lighter distally. Femur enlarging from base to apex, with a very robust spur-like process on its outer, ventro-lateral surface near the distal extremity, the anterior edge of the spur being provided with a row of short black tubercles; a few similar tubercles on the proximal portion of the inner ventro-lateral surface; sparsely provided with spinose hairs. Patella short,

thick, so united with the femur as to form an arch, with sparse hairs and a few scattered tubercles on its dorsal and outer-lateral surfaces; tibia arched, densely clothed with long, black hairs; a patch of short, black tubercles on the proximal portion of its ventral surface, and a short row of similar tubercles on the apical portion of its inner, ventro-lateral surface; tarsus clothed with long, black hairs, with a row of short, black tubercles on its inner ventro-lateral surface, terminating in a short, denticulate claw. Ventrum light reddish-brown. Coxæ reddish, with a few short hairs; two front pairs with a row of subobsolete tubercles on the anterior border. Trochanters light brown, darker above; remaining joints of legs reddish-brown with darker annuli; femora, patella, and tibia having rows of short spines. Shaft of genital organ very robust, flattened, distally curved and suddenly contracted, and terminating in a short, acute point.

Described from several Illinois specimens. This is a rare form of which the female is yet unknown. The species does not strictly belong to *Liobunum* on account of the process on the femur of the palpus, but as this may be merely a sexual peculiarity not possessed by the female, I leave it in that genus for the present. I have a single specimen collected on Catawba Island by Mr. J. S. Hine.

***Liobunum maculosum* (Wood) Weed.**

(Plate LXVI.)

*Phalangium maculosum* Wood, *Conn. Essex Inst.*, VI, 31-32, 40.

*Phalangium maculosum* Wood, *Underwood, Can. Ent.*, XVII, 168.

*Phalangium* (?) *maculosum* Wood, *Weed, Bull. Ill. State Lab. Nat. Hist.*, III, 104.

*Liobunum maculosum* (Wood), *Weed, Amer. Nat.*, XXIV, 918; *Trans. Am. Ent. Soc.*, XIX, 191.

MALE.—Body 8<sup>mm</sup> long; 4.5<sup>mm</sup> wide; palpi 5.5<sup>mm</sup> long. Legs: first, 19<sup>mm</sup>; second, 33<sup>mm</sup>; third, 21<sup>mm</sup>; fourth, 26<sup>mm</sup>.

FEMALE.—Body 11<sup>mm</sup> long; 6<sup>mm</sup> wide; palpi 5<sup>mm</sup> long. Legs: first, 16<sup>mm</sup>; second, 32<sup>mm</sup>; third, 20<sup>mm</sup>; fourth, 27<sup>mm</sup>.

Body large; dorsum granulate, cinnamon-brown, with an indistinct darker, vase-shaped central marking, beginning at the eye eminence, contracting slightly on the first abdominal segment, and then slightly expanding and running with nearly parallel sides to the posterior extremity; a great many small yellow spots on the abdominal segments arranged in irregular transverse series (in the male under examination there is on the front margin of the middle of the first abdominal segment, and between that and the eye eminence on the cephalothorax, transverse masses of minute golden dots); in front of eye eminence is a whitish V-shaped mark. Eye eminence well developed; black, except a whitish spot at the base both in front and behind; contracting from base upward; scarcely canaliculate; with two subobsolete rows of blackish tubercles. On the front margin of the cephalothorax, directly in front of the eye eminence, is a patch of three rows of small

black tubercles, sometimes subobsolete; other similar, but smaller tubercles are scattered near the rest of the margin of the cephalothorax. Mandibles brownish white, with tips of claws deep black. Ventral surface of palpi very light brown, almost white; dorsal surface brown, femur and patella darker than the rest; inner distal angle of femur and patella slightly prolonged in female, scarcely so in male; femur, patella, and tibia furnished with rows of spinous tubercles, which on tarsus are represented by similar, but more numerous rows of stiff spines. Ventral surface very light brown, almost whitish; coxæ tuberculate, same color as rest of ventrum. Trochanters black, rest of legs cinnamon-brown, darker at articulations; proximal joints having numerous spinose tubercles. Genital organ of male "robust, somewhat flattened, distally alate, bent through its entire length with a double, bow-like curve; at its distal extremity blunt, not bent, with a sharp, slender, straight, projecting point."

Warren County; Lawrence County, July, 1889. A rare form, bearing a close general resemblance to *L. grande*. It is possible that it is an immature form of *grande*.

*Liobunum grande* (Say) Weed.

(Plate LXVII.)

*Phalangium grandis* Say, Jour. Phil. Acad. Nat. Sci., II, 67; Compl. Writings, II, 14.

*Phalangium grande* Say. Wood, Comm. Essex. Inst., VI, 34, 40.

*Phalangium grande* Say. Underwood, Can. Ent., XXIV, 168.

*Phalangium* (?) *grande* Say. Weed, Bull. Ill. State Lab. Nat. Hist., III, 105.

*Astrobinus* (?) *grande* (Say). Weed, Amer. Nat., XXIV, 917.

*Liobunum grande* (Say). Weed, Trans. Am. Ent. Soc., XIX, 192.

MALE.—Body 9<sup>mm</sup> long; 5<sup>mm</sup> wide; palpi 6<sup>mm</sup> long. Legs: first, 21<sup>mm</sup>; second, 36<sup>mm</sup>; third, 23<sup>mm</sup>; fourth, 32<sup>mm</sup>.

Dorsum minutely tuberculate, with numerous larger, black, spinose tubercles scattered thickly over the surface, being especially numerous on the cephalothorax and anterior portion of abdomen and occurring in a dense quadrangular patch just in front of eye eminence. Dorsum varying from ferruginous-brown to almost black, with numerous small, yellowish, not very distinct spots on the abdomen, arranged in irregular transverse series, sometimes subobsolete, having a dark-brown central vase-shaped marking beginning at the sides of the eye eminence, where it is quite broad, and contracting until it reaches the middle of the first abdominal scutum, then gradually expanding to the middle of the abdomen, then again gradually contracting toward posterior extremity; this band sometimes obsolete, or nearly so. Eye eminence black, prominent, rounded, somewhat canaliculate, each carina usually having a row of five or six well-developed, acute, black, conical tubercles. Segmentation of cephalothorax with abdomen not very distinct, and of anterior abdominal segments nearly obsolete. Palpi dull yellowish-brown, often mottled with black, especially on

patella and tip of femur; rather long, slender, with the inner distal angle of patella sometimes slightly prolonged; joints slightly arched, especially patella; femur, patella, especially on dorsal surface, and tibia, furnished with numerous black, spinose tubercles and hairs; tarsus furnished with hairs, and with a row of tubercles on its inner ventro-lateral surface. Mandibles light yellowish brown, tips of claws black; second joint furnished with numerous stiff, blackish hairs. Ventrum light brown or grayish; sides of pectus and coxæ tuberculate; trochanters black, tuberculate; remaining portions of legs dark brown, except the joints and tarsi, which are blackish. Genital organ similar to that of *L. maculosum*.

FEMALE.—Body 12<sup>mm</sup> long; 6.5<sup>mm</sup> wide; palpi 6<sup>mm</sup> long. Legs: first, 20<sup>mm</sup>; second, 35<sup>mm</sup>; third, 21<sup>mm</sup>; fourth, 28<sup>mm</sup>.

Differs from the male in its larger body, especially the abdomen, and in having fewer tubercles on the dorsum and palpi.

Ohio: Franklin County, August 4, 1890; Fulton County, August, 1890; Lawrence County, July, 1889, September 5, 1890; Warren County, July 5, 18, August, 1890.

*Liobunum grande* (Say) var. *simile* Weed.

*Liobunum similis* Weed, Amer. Nat. xxiv, 918; Trans. Am. Ent. Soc. xix, 193.

MALE.—This variety is at once distinguished by the deep black color of the palpi and mandibles. It does not differ in other respects from normal *grande*.

Ohio: Cuyahoga County, August, 1889; Butler County, September, 1890. I have not yet seen any females having the markings of this variety.

*Mitopus* Thorell, 1876.

First joint of mandibles with a strong tooth on ventral surface near base. Maxillary lobes of the second pair of legs in the form of elongated triangles, large at base, anterior border straight. Claw of palpus not denticulate. The body teguments are soft or subcoriaceous, and the anterior border of the cephalothorax in our species is provided at the middle with three small geminated points. The dorsal surface is provided usually with small teeth, which, on the abdomen, are arranged in transverse series. The eye eminence is of medium size, about as wide as long, lightly canaliculate, and provided with two series of low tubercles.

But two American species have been described, both of which are found in Ohio. They may be distinguished thus.

Legs mottled gray, not pinkish.....*pictus*.  
 Legs with a distinct pinkish tinge.....*ohiocensis*.

*Mitopus pictus* (Wood) Weed.

(Plate LXII, Fig. 2.)

*Phalangium pictum* Wood, *Conn. Essex Inst.*, VI, 30-31.*Oligolophus pictus* (Wood). *Weed, Amer. Nat.*, XXI, 35.*Oligolophus pictus* (Wood). *Weed, Bull. Ill. St. Lab. N. H.*, III, 95-97.*Mitopus pictus* (Wood). *Weed, Amer. Nat.*, XXVI, 528.

MALE.—Body 5<sup>mm</sup> long, 3.2<sup>mm</sup> wide; palpi, 4.1<sup>mm</sup> long. Legs: first, 11<sup>mm</sup>; second, 27<sup>mm</sup>; third, 13<sup>mm</sup>; fourth, 20<sup>mm</sup>.

Dorsum minutely scabrous, mottled ash-gray, much lighter in some specimens than others. Dark central marking generally very distinct, commencing at the anterior border of the cephalothorax, the dorsal surface of which it almost covers, and suddenly contracting at its posterior margin, so that it starts on the abdomen as a narrow line, slightly wider than the eye eminence, then gradually expanding until it reaches the end of the anterior third of the abdomen, where it suddenly contracts, its borders irregularly curving toward the dorso-meson, then expanding again, though not becoming as wide as before, and finally gradually contracting and running as a stripe to the last segment, or, as in some specimens, simply terminating at the anterior margin of the penultimate segment. Anterior margin of cephalothorax nearly straight, lateral angles slightly produced, each having a black spine on an elevated base; three large brownish black, tooth-like processes just back of the middle of the margin, each terminating with a minute spine, the middle process being slightly in front of the others. Back of these, but in front of the eye eminence, there is a curved series of minute spines on whitish elevated bases, and back of the eye eminence, on the cephalothorax, there are two similar nearly transverse series. There is also a similar transverse series on each segment of the abdomen most easily seen on the black central marking. Eye eminence large, brownish, canaliculate; each carina having four thick, brownish tubercles, each of which terminates in a black spine. Mandibles light brown, tips of claws black; dorsal surface of second joint and of apical portion of first joint furnished with short black hairs; second joint with a blunt tubercle on its inner dorso-lateral surface, just above the base of the finger forming part of the claw, and the apical portion of its outer lateral surface (behind the insertion of the thumb) prolonged into a tubercular process. Thumb with a prominent dorsal tubercle near its base. Palpi mottled; the outer ventro-lateral portion of the femur with an irregular row of long, slender, white tubercles, terminating with black spines; inner ventro-lateral surface with a series of long, black, curved, spinous hairs; inner lateral surface with similar shorter hairs more numerous, forming a brush on the slightly produced inner distal angle; dorsal and outer lateral surfaces with short spinous hairs; patella nearly as long as tibia, its inner distal angle produced and furnished with a brush of black hairs with recurved tips; shorter hairs in

distant rows on its dorsal and lateral surfaces; tibia with its inner lateral distal angle slightly swollen, not projecting forward as does that of the patella, but furnished with a similar brush of hairs; outer ventro-lateral surface with a subobsolete row of white tubercles, tipped with spinous hairs; dorsal and outer lateral surface furnished with sparse short hairs; tarsus thickly covered with long, black, recurved hairs, usually with a row of subobsolete, short, black tubercles on its inner ventro-lateral surface, and terminating in a moderately robust simple claw. Ventrums light grayish brown, hispid. Legs short, robust; coxae light gray, covered with spinous hairs on elevated bases; trochanters light brown or grayish, tuberculate; remaining joints mottled with blackish brown and gray; all except tarsi with longitudinal rows of small black spines, and acute tubercles on their dorso-distal borders; tibiae angular; tarsi hairy. Sheath of genital organ enlarged distally, truncate; shaft moderately robust, distally canaliculate, then expanded into a spoon-shaped portion, and terminating in a short, black, acute, articulated piece.

FEMALE.—Body larger and more robust; besides which it also differs from the male in having no tubercles on the mandibles. Apical joints of ovipositor grayish.

Ohio: Franklin County, Fulton County, August, 1890; Fairfield County, September 20, 1890.

*Mitopus ohioensis* Weed.

(Plate LXVIII.)

*Oligolophus ohioensis*. Weed, Amer. Nat., xxiv, 1103.

FEMALE.—Body, 6<sup>mm</sup> long, 3.5<sup>mm</sup> wide. Legs: first, 8<sup>mm</sup>; second, 20<sup>mm</sup>; third, 15<sup>mm</sup>; fourth, 10<sup>mm</sup>.

Dorsum of a peculiar glossy gray, central marking indistinct, shown mostly by stripes at outer margin; beginning at anterior lateral angles of cephalothorax two faint blackish stripes run obliquely back and toward the middle of the anterior border of the abdomen (forming a truncate V) and then run nearly parallel to each other two-thirds of the way to the posterior extremity, although they are nearly obsolete on the anterior third of the abdomen. Dorsum of cephalothorax free from tubercles except on margins, but having many minute brownish granules. Dorsum of abdomen with numerous, very minute pits scattered over its entire surface; and an indistinct transverse row of small whitish tubercles, tipped with very minute dark spines on each segment. Division between the cephalothorax and abdomen almost obsolete, and segmentation of anterior abdominal segments wholly so. Cephalic margin of cephalothorax nearly straight; lateral angles slightly produced, each having a small black spine; three prominent, acute, grayish tubercles on middle of anterior margin, each tipped with a minute black spine, the middle one being nearly twice as large as



those on the side, and also slightly in front of them. Eye eminence prominent, constricted at base; grayish, except a dark spot about each eye; eyes small; canaliculate, and having on each earina a row of four prominent, conical, grayish tubercles, each terminating in a minute black spine. Mandibles light brown, claws tipped with black; dorsal surface of second joint furnished with short black hairs. Palpi mottled; ventral surface of femur with numerous white, elongate, conical tubercles, each tipped with a prominent black spine; dorsal surface furnished with numerous black spinous hairs, many of which are tipped with white; patella short, with its inner lateral distal angle much prolonged (almost equaling the patella in length), the whole inner lateral surface being thickly set with strong spines, black tipped with white; a few smaller spines on its dorsal surface. Tibia slightly longer than patella, its inner lateral distal angle slightly prolonged, and its inner lateral surface provided with spines like those on the patella; its dorsal and outer lateral surfaces also having smaller and sparser spines, and its ventral surface being provided with a few whitish conical tubercles tipped with black spines; tarsus furnished with many rows of rather long black stiff hairs, and having two small black tubercles at the base of the well developed claw. Ventrums light gray, hispid. Legs very short, robust, pinkish; coxae light gray with a slight pink tinge, provided with rather long, stiff black hairs on elevated, whitish bases; trochanters tuberculate, light gray with a pink tinge; remaining joints pinkish, all except tarsi having longitudinal rows of small black spines.

Described from one specimen collected in Warren County, Ohio, during the summer of 1889. I have since received from Prof. S. A. Forbes one other specimen taken in Illinois, which appears to belong to the same species.

A reëxamination of the type specimen after it has been in alcohol nearly four years shows that it was apparently just ready to moult when captured. The body has shrunk away from the outer skin, and an inner one seems to cover it. This leads to the suspicion that this is an immature form of *M. pictus*, the pink coloring possibly being due to the peculiar conditions of the moulting period.

#### Phalangium Linné.

Body soft or sub-coriaceous, with dorsum generally furnished with small sharp tubercles, which on the abdomen are arranged in transverse series. Eye eminence canaliculate, with two series of pointed tubercles. Lateral pores large, oval, and near the margin. Mandibles short and simple in the female, often more developed and provided with tubercles in the male; first article unarmed below. Palpi simple, often having the inner distal angle of the femur and of the patella very slightly produced, but never prolonged into a process; hairs equal, or sometimes thicker on the inner side, but not forming a brush; patella always shorter than tibia; maxillary lobe provided at the base with two conical

tubercles. Maxillary lobe of the second pair of legs much longer than wide, gradually narrowing from the base to the extremity, directed obliquely forward and not meeting; anterior border straight. Pectus large, parallel between the coxæ, rounded in front or slightly lanceolate, more rarely enlarged and obtusely truncate. Feet long, more or less robust. Claw of palpus simple.

But one species of this genus has been found in Ohio.

*Phalangium cinereum* Wood.

(Plate LXIX.)

*Phalangium cinereum* Wood, *Comm. Essex Inst.*, vi, 25; *Weed, Amer. Nat.*, xxvi, 32; *Trans. Amer. Ent. Soc.*, xix, 269.

MALE.—Body, 5–6.8<sup>mm</sup> long; 3–4<sup>mm</sup> wide; palpi, 4<sup>mm</sup> long. Legs: first, 23–33<sup>mm</sup>; second, 44–52<sup>mm</sup>; third, 24–33<sup>mm</sup>; fourth, 31–36<sup>mm</sup>.

Dorsum ash-gray, sometimes more or less brownish, with a wide, vase-shaped central marking, which is sometimes obsolete. There is a transverse series of small spinose tubercles behind the eye eminence, another row on posterior border of cephalothorax, and one row on each abdominal segment except the last two; a curved series of similar tubercles is found in front of the eye eminence. These tubercles have whitish bases and acute black apices, and generally also have a spinose hair arising on one side near the apex of the white portion and reaching beyond the tip of the tubercle. In front of eye eminence there are two longitudinal series of three each of these tubercles. Lateral borders of cephalothorax subsinuate. Eye eminence low, canaliculate, with a series of five or six tubercles like those on dorsum on each carina. Mandibles brownish white, tips of claws black; second joint and apical portion of first joint furnished with short, black, stiff hairs. Palpi light brown, rather slender, first four joints with minute tubercles and short black hairs; none of the angles prolonged; tarsal joint without tubercles, but with hairs; claw moderately robust. Venter, including coxæ, light grayish brown, with many somewhat quadrangular patches of a more pronounced brown, and scattered blotches of chocolate-brown. Trochanters light brown, with many small tubercles; remaining joints of legs cinnamon-brown, more or less annulated with lighter and deeper shades; angular, with longitudinal rows of black spines; sheath of genital organ subcylindrical, truncate; shaft robust, with two lateral oval openings near distal extremity, then contracted into a blunt scoop-shaped piece, turned upward at nearly a right angle and terminating in a slender acute point.

FEMALE.—Body, 6–9<sup>mm</sup> long, 4–5<sup>mm</sup> wide; palpi, 4<sup>mm</sup> long. Legs: first, 21–29<sup>mm</sup>; second, 39–52<sup>mm</sup>; third, 22–29<sup>mm</sup>; fourth, 30–37<sup>mm</sup>.

Differs from male as follows: Body larger, rounder. Dorsum darker gray, more mottled, central marking more distinct; tubercles on dorsum smaller, those on eye eminence more numerous, and those forming the longitudinal series in front of eye eminence also more numerous. Palpi

with hairs but without tubercles. Legs with annulations more distinct; trochanters without tubercles; spines on femur less prominent, and those on tibia obsolete; narrow quadrangular patches on venter of abdomen arranged in transverse series. Distal joints of ovipositor blackish; about thirty in number.

Ohio: Butler county, September 1, 1890; Delaware county, September 18, 1890; Erie county, July 5, 1890; Franklin county, October 4, 1890, September 18, 20, 21, 1889; October 18, 1889; Lawrence county, July, 1889; Madison county, July 21, 1890.

"The ash-gray harvest-spider passes the winter in the egg state. A few years ago in Illinois I found a bunch of about a dozen small, white, spherical eggs slightly beneath the soil surface, which were transferred to breeding cages. During the spring they hatched into small gray Phalangiids, which were believed to belong to the present species. I have never seen the female engaged in oviposition, but the structure of the ovipositor indicates that the eggs are deposited in the ground about half an inch below the surface. In the latitude of central Ohio there are apparently two broods each season, the first maturing late in June or early in July, and the second, which is much more numerous in individuals, in September.

"This species is preëminently what may be called an in-door form. It abounds especially in sheds, outhouses, and neglected board piles, being rarely found in the open field. Its color especially fits it for crawling over weather-beaten boards, making it inconspicuous against such a background. During the day it is usually quiet, but at dusk and on cloudy days it moves about quite rapidly. It probably feeds upon small flies and other insects that it finds during its nocturnal rambles. The only natural enemies I have seen it suffering from are the web-making spiders, in the webs of which it often perishes by getting its long legs inextricably entangled."\*

Individuals of this species seem to be very irregular in becoming fully developed, and it is difficult to determine whether there is more than one generation a year or not.

#### EXPLANATION OF PLATES.

##### PLATE LVII.

Fig. 1. *Liobunum vittatum*. Male. Natural size.

2. Structural details of same, magnified: *a*, body; *b*, eye-eminence, side view; *c*, eye-eminence, front view; *d*, palpus, side view; *e*, claw of palpus, side view.

3. *Liobunum vittatum dorsatum*. Male from Dakota. Natural size.

##### PLATE LVIII.

Fig. 1. *Liobunum vittatum*. Female. Natural size.

2. Structural details of same, magnified: *a*, body; *b*, eye-eminence, side view; *c*, eye-eminence, front view; *d*, palpus, side view; *e*, claw of palpus, side view.

\*Weed, American Naturalist, xxvi, 32.

## PLATE LIX.

- Fig. 1. *Liobunum nigropalpi*. Male. Natural size.  
 2. Structural details of same, magnified: *a*, body; *b*, eye-eminnence, side view; *c*, eye-eminnence, front view; *d*, palpus, side view; *e*, claw of palpus, side view.

## PLATE LX.

- Fig. 1. *Liobunum nigripes*. Male. Natural size.  
 2. Structural details of same, magnified: *a*, body; *b*, eye-eminnence, side view; *c*, eye-eminnence, front view; *d*, palpus, side view; *e*, claw of palpus, side view.

## PLATE LXI.

- Fig. 1. *Liobunum politum*. Male. Natural size.  
 2. Structural details of same, magnified: *a*, body; *b*, eye-eminnence, side view; *c*, eye-eminnence, front view; *d*, palpus, side view; *e*, claw of palpus, front view.

## PLATE LXII.

- Fig. 1. *Liobunum longipes*. Structural details of male, magnified: *a*, body; *b*, eye-eminnence, side view; *c*, eye-eminnence, front view; *d*, palpus, side view; *e*, claw of palpus, side view.  
 2. *Mitopus pictus*. Structural detail of male, magnified: *a*, body; *b*, eye-eminnence, side view; *c*, eye-eminnence, front view; *d*, palpus, side view; *e*, claw of palpus, side view; *f*, tip of mandible; *g*, genital organ.

## PLATE LXIII.

- Fig. 1. *Liobunum ventricosum*. Male. Natural size.  
 2. Structural details of same, magnified: *a*, body; *b*, eye-eminnence, side view; *c*, eye-eminnence, front view; *d*, palpus, side view; *e*, claw of palpus, side view; *f*, maxillary lobes of second legs.

## PLATE LXIV.

- Fig. 1. *Liobunum bicolor*. Female. Natural size.  
 2. Structural details of same, magnified: *a*, body, with legs and palpi removed; *b*, eye-eminnence, side view; *c*, eye-eminnence, front view; *d*, palpus, side view; *e*, claw of palpus, side view.

## PLATE LXV.

- Fig. 1. Supposed immature male of *L. bicolor*.  
 2. Structural details of same, magnified: *a*, body; *b*, eye-eminnence, side view; *c*, eye-eminnence, front view; *d*, palpus, side view; *e*, claw of palpus, side view.

## PLATE LXVI.

- Fig. 1. *Liobunum maculosum*. Female. Natural size.  
 2. Structural details of same, magnified: *a*, body; *b*, eye-eminnence, side view; *c*, eye-eminnence, front view; *d*, palpus, side view; *e*, claw of palpus side view.

## PLATE LXVII.

- Fig. 1. *Liobunum grande*. Male. Natural size.  
 2. Structural details of same, magnified: *a*, body; *b*, eye-eminnence, side view; *c*, eye-eminnence, front view; *d*, palpus, side view; *e*, claw of palpus, side view; *g*, maxillary lobe of second leg.

PLATE LXVIII.

Fig. 1. *Mitopus ohioensis*. Female. Natural size.

2. Structural details of same, magnified: *a*, body; *b*, eye-eminence, side view; *c*, eye-eminence, front view; *d*, palpus, side view; *e*, claw of palpus, side view.

PLATE LXIX.

Fig. 1. *Phalangium cinereum*. Male. Natural size.

2. Structural details of same, magnified: *a*, body; *b*, eye-eminence, side view; *d*, palpus, side view; *e*, claw of palpus, side view; *f*, maxillary lobe of second leg; *h*, tip of ovipositor; *i*, dorsal tubercle.